

I claim:

1. Apparatus connected to the downhole end of a tubing string for cleaning and flushing wells comprising:

a hollow tubular member having first and second ends, the first end threaded for connection to the tubing string;

5 at least one primary jet orifice, leading from the tubular member interior at the second end and directed toward the bottom of the well; and

a plurality of secondary jet orifices arranged around the exterior of the tubular member, leading from the tubular member interior and directed upwardly at an acute angle with respect to the longitudinal axis of the tubular member and skewed radially at an angle with respect to a radius of the tubular member surface, wherein the aggregate cross-sectional area of the secondary jet orifices is at least one and one-half times, but not more than four times, the aggregate cross-sectional area of the at least one primary jet orifice.

10

2. The apparatus of claim 1 wherein the secondary jets are skewed at an angle opposed to the thread direction, so that jet reaction forces tend to tighten the threaded connection.
3. The apparatus of claim 1 wherein the primary jet is mounted for rotation with respect to the hollow tubular member.
4. The apparatus of claim 1 wherein the primary jet is covered and protected by an open ended shroud.
5. The apparatus of claim 3 wherein the primary jet is driven to rotate by the fluid flow therethrough.
6. The apparatus of claim 3 wherein the primary jet is driven to rotate by fluid flow contacting inclined vanes .
7. The apparatus of claim 3 wherein the primary jet is driven to rotate by fluid flow through one or more inclined orifices.

8. A method for cleaning and flushing wells comprising the steps of connecting a tubing string to a pressurized fluid source at the ground surface;

running the string downhole;

5 loosening and agitating undesirable material below the downhole end of the string with a primary flow of downwardly directed fluid;

entraining and pulling the undesirable materials upward with a low pressure zone created above the primary flow source by an upwardly directed secondary gaseous flow, one and one-half to four times greater than the

10 primary flow; and

carrying the entrained materials to the surface with the combined primary and secondary fluid flows.

9. The method of claim 8 and further comprising the step of rotating the downwardly directed primary jet flow.
10. The method of claim 8 wherein the fluid flow is gaseous in nature.
11. The method of claim 8 wherein the fluid flow is liquid in nature.
12. The method of claim 8 wherein the fluid flow is of a gaseous liquid nature.